Claims

1. Configuration for the acquisition and/or monitoring of medical data, in particular the state of the cardiovascular and pulmonary system, blood values or blood composition, characterised by at least one measuring sensor for the acquisition of the medical data such as the state of the cardiovascular system, etc. of a person comprising at least one light source which can emit light at least at two wavelengths, as well as at least one light receiver for determining the light transmitted and/or reflected through a tissue portion of a person or an animal further comprising means in order to increase the optical Signal-to-Noise and/or Signal-to-Background ratio.

2. Configuration according to claim 1 and at least one beam shaping optical element to direct the emitted light into a human or animal tissue and the light receiver.

3. Configuration according to claim 2, characterised in that the beam shaping element is a diffractive or refractive beam shaping element.

4. Configuration according to one of the claims 1 to 3, characterised in that at least two light emitting sources, such as LEDs, are arranged and that two beam shaping elements are arranged to direct the emitted light into the same area within the human or animal tissue and that the light receiving element is a photo detecting element.

5. Configuration for the acquisition and/or monitoring of medical data, in particular the state of the cardiovascular and pulmonary system, blood values or blood composition, characterised by at least one measuring sensor for the

acquisition of the medical data such as the state of the cardiovascular system, etc. of a person comprising at least one light source which can emit light at least at two wavelengths, as well as at least one light receiver for determining the light transmitted and/or reflected through a tissue portion of a person or an animal and at least one light tray and/or optical wavelength filter.

6. Configuration according to claim 5, characterised in that the optical wavelength filter is an optical double band pas filter.

7. Configuration according to claim 5, characterised in that the light receiver has such a limited detection sensitivity that the two frequencies of the light source are within the sensitivity area of the receiver.

8. Configuration according to claims 1 to 7, characterised in that at least a wavelength filter and/or a light trap, such as geometrical baffles, are adapted to suppress, by geometric and/or optical means, the parasitic contribution of environmental radiation in order to increase and stabilise the signal/background ratio versus environmental conditions.

9. Configuration for the acquisition and/or monitoring of medical data, in particular the state of the cardiovascular and pulmonary system, blood values or blood composition, etc., characterised by at least one measuring sensor for the acquisition of the medical data, such as the state of the cardiovascular and pulmonary system, etc. of a person comprising at least one light source which can emit light at least at two wavelengths, as well as at least one light

receiver for determining the light transmitted and/or reflected through a tissue portion of a person or an animal,

- at least one beam shaping optical element to direct the emitted light into a human or animal tissue and the light receiver, and

- at least one light trap such as geometrical baffles and/or an optical wavelength filter, such as a double band pass filter.

10. Configuration according to claims 1 to 9, comprising light source amplitude modulating or light source modulating means to shift the frequency of the emitted light.

11. Configuration according to claim 10, comprising a light source amplitude modulating means to modulate the frequency of the emitted light in a frequency range substantially outside of frequency of noise and/or environmental signals.

12. Configuration according to claim 10 or 11, comprising means for light source amplitude modulation or light source modulating means to shift the frequency of the emitted light in a range where environmental disturbances are substantially neglectable.

13. Configuration according to one of the claims 10 to 12, comprising means for light source amplitude modulating or light source modulating means to shift the frequency of the emitted light in a range of above 120 Hz, preferably above 500 Hz.

14. Configuration according to one of the claims 1 to 13, comprising mechanical fixing means for arranging the configuration at a human or animal tissue as e.g. at an earlobe of an ear, the means guaranteeing that the beam path between the light emitter and the light receiver is always co-linear with the optical axis of the light emitter and the light receiver.

15. Configuration according to claim 14, wherein the means for fixing include a rigid frame with two U- or V-like arranged arms, where in the area of the one arm end the photo detector is arranged, and at the area of the other arm end a clamping mechanism within the LED is arranged screwably connected to the clamping mechanism, so that the distance between the light receiver and the light transmitter can be varied in such a way that the beam path between the light emitter and light receiver always is co-linear with the optical axis of the light emitter and light receiver.

16. Configuration according to claim 15, wherein the arm of the frame wearing the clamp mechanism with the light emitter is removably attached to the frame, the connection between the frame and the removable arm being a snap-like mechanism to ensure that the removable arm is fixed to the frame in a constant, predetermined manner.

17. Pulsoximetric sensor, including a configuration according to one of the claims 1 to 16.

18. Method for measuring and/or monitoring of medical data, in particular the state of the cardiovascular and pulmonary system, blood values or blood composition, etc.,

characterised in that within a pulsoximetric sensor from at least one light source, such as an LED, at least at two wavelengths, light is emitted, the light is transmitted and/or reflected through a tissue portion of a person or an animal and is received by at least one light receiver for determining the light transmitted and/or reflected through the tissue portion, the light from the light emitting source, such as the LED or the LEDs, is directed by using beam shaping elements, such as e.g. diffractive or refractive beam shaping elements into the human tissue and photo detecting element.

19. Method for measuring and/or monitoring of medical data, in particular the state of the cardiovascular and pulmonary system, blood values or blood composition, etc., characterised in that within a pulsoximetric sensor from at least one light source such as an LED, at least at two wavelengths, light is emitted, the light is transmitted and/or reflected through a tissue portion of a person or an animal and is received by at least one light receiver for determining the light transmitted and/or reflected through the tissue portion, the light from the light emitting source, such as the LED or the LEDs, is directed through a light tray and/or an optical wavelength filter, wavelength filter preferably is an optical double band pass filter adapted to the power spectrum of the band limited light sources such as LEDs.

20. Method for measuring and/or monitoring of medical data, in particular the state of the cardiovascular and pulmonary system, blood values or blood composition, etc.,

characterised in that within a pulsoximetric sensor from at least one light source, such as an LED, at least at two wavelengths, light is emitted, the light is transmitted and/or reflected through a tissue portion of a person or an animal and is received by at least one light receiver for determining the light transmitted and/or reflected through the tissue portion, the at least one light source is pulsed operated with a phase shifting or modulation of the frequency, so that the frequency of the emitted light is in a range substantially outside of the frequency of noise and/or environmental signals, the pulsed light with the mentioned frequency is received by the, at least one, light receiver after passing through the tissue portion and finally a reversed phase shifting or modulation is executed to calculate the real values of the pulsoximetric measurement.

21. Use of the configuration according to one of the claims 1 to 16 for pulsoximetric measurements, which means for the non-invasive monitory of pulsation, oxygen saturation, arterial carbon dioxide partial tension and/or content of blood sugar in arterial human or animal blood.